TENNANT CREEK

AND

CORRALITOS CREEK

DRAFT

PLANNING STUDY

DECEMBER 1984

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1984

Santa Clara Valley Water District

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SANTA CLARA VALLEY WATER DISTRICT

TENNANT CREEK AND CORRALITOS CREEK PLANNING STUDY

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DECEMBER 1984

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Introduction

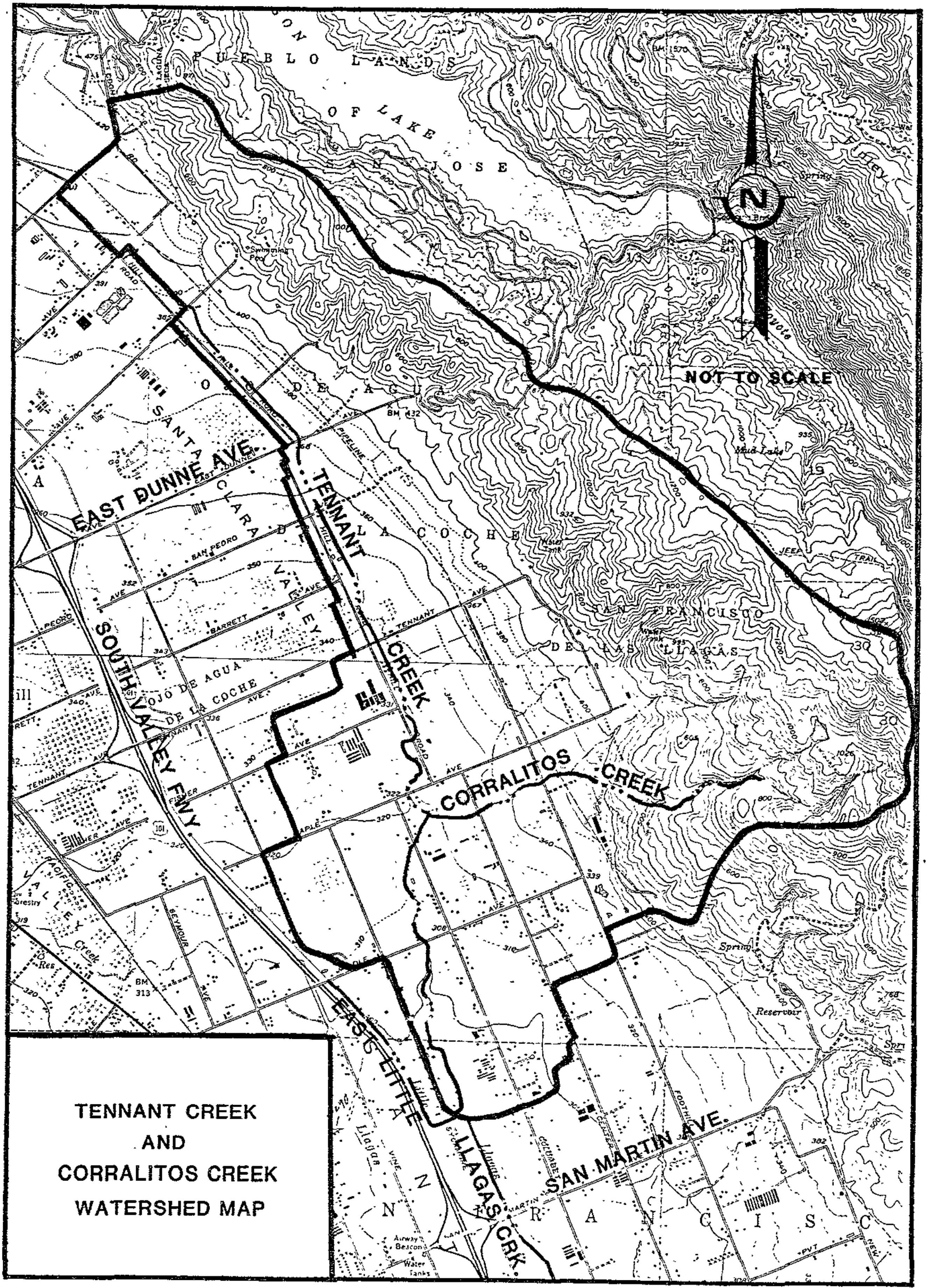
Flooding has occurred numerous times on Tennant and Corralitos Creeks. The objective of this report is to identify 1) a permanent solution to the flood problems on Tennant and Corralitos Creeks, 2) interim measures consistent with the ultimate flood control measures, and 3) an implementation strategy for the interim measures.

Background

Corralitos Creek and its largest tributary, Tennant Creek, drain 7.07 square miles of the east side of the Llagas Creek Basin in the District's South Flood Control Zone (Figure 1). Watershed elevations vary from approximately 290 feet to 1300 feet above sea level. The study reach includes Corralitos Creek from its confluence with East Little Llagas Creek to Tennant Creek and Tennant Creek from Corralitos Creek to the limit of District jurisdiction (Figure 2). Of the 4.36 channel miles in the study reach, 1.23 miles are within the City Limits of Morgan Hill and 3.13 miles are in unincorporated County lands. The study reach is predominantly low to moderate density rural land.

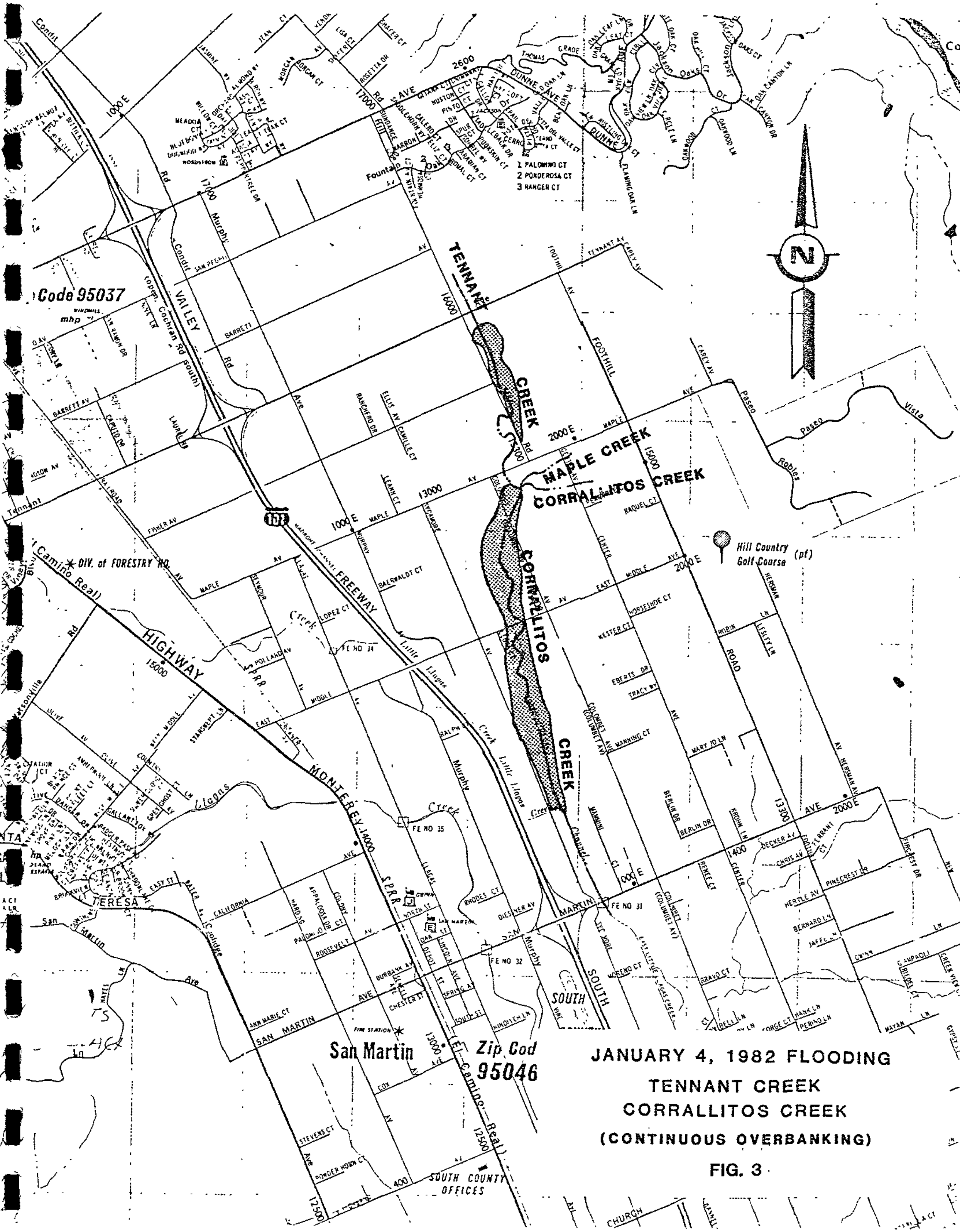
The existing channels along the study reach vary from an excavated earth channel constructed by developers on the upper end of Tennant Creek to a shallow swale near the lower end of Corralitos Creek. The study reach includes seven existing and five future road culverts. The entire existing channel system is inadequate to convey the 1% flood.

Floodplain studies including portions of the study reach have been conducted by both the U. S. Army Corps of Engineers and the U.S. Soil Conservation Service. The 1975 Corps Floodplain Information Study for Llagas Creek Unit 1 identified floodplain limits along portions of the study reach for the intermediate regional and the standard project floods.



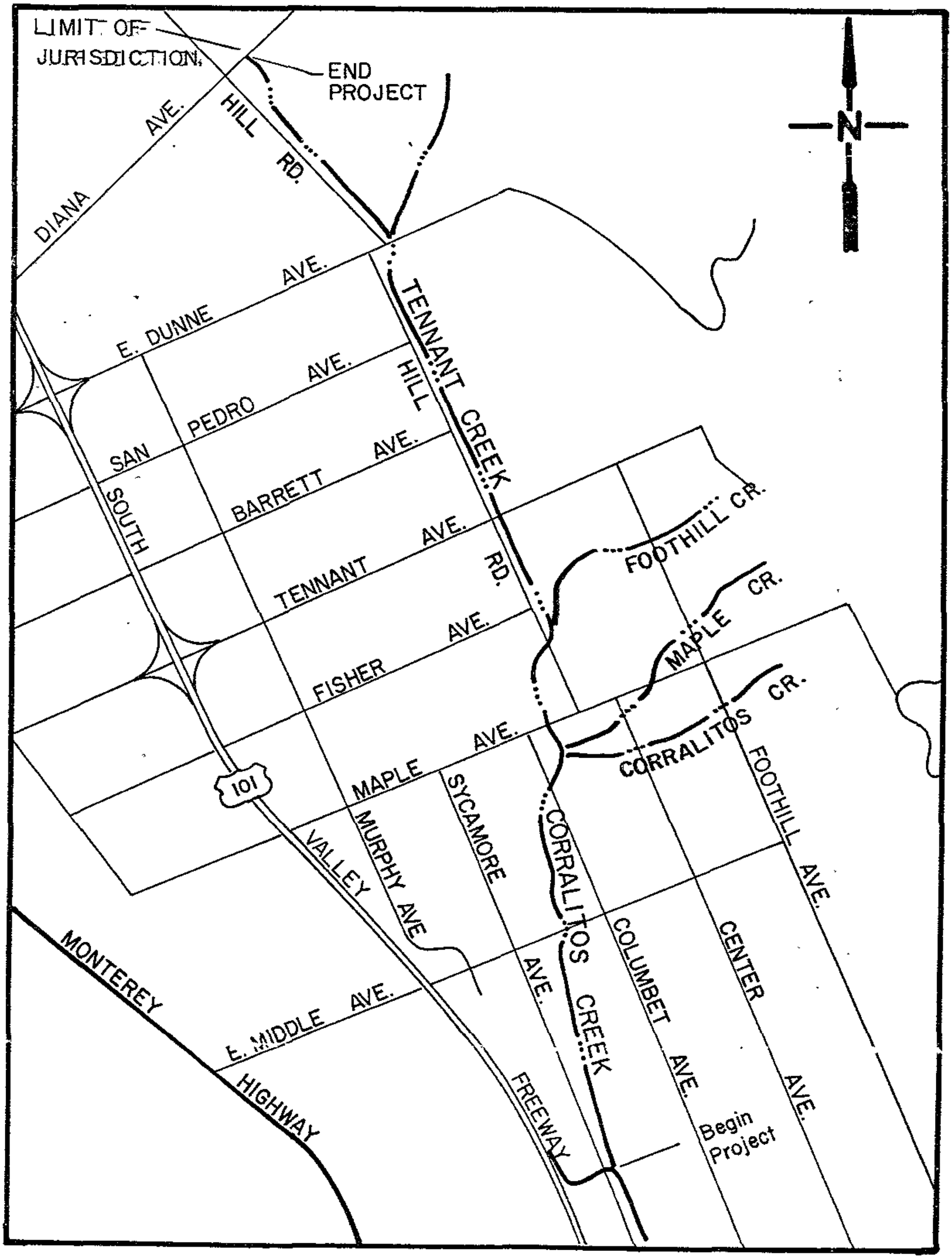
TENNANT CREEK
AND
CORRALITOS CREEK
WATERSHED MAP

FIG. 1



JANUARY 4, 1982 FLOODING
TENNANT CREEK
CORRALLITOS CREEK
(CONTINUOUS OVERBANKING)

FIG. 3



PROJECT LOCATION MAP

FIG. 2

Improvements from East Little Llagas Creek to East Dunne Avenue were originally included in the Watershed Work Plan for Upper Llagas Creek prepared by the SCS under the authority of Public Law 566. Right of way requirements, channel geometry and channel profile were defined. The right of way which was identified was protected by District Ordinance 69-1 pursuant to the Colby-Alquist Floodplain Management Act of the State of California. The proposed project and selected alignment were presented to the public.

When the work plan was reevaluated in 1980, Tennant and Corralitos Creeks were excluded from the project because the cost of channel improvements could not be justified by the potential flood damage reduction. Because lands in the study reach are low to moderate density rural lands, potential property damage due to flooding is low compared to the project cost.

Problem Definition

Historical Flood Problems

Tennant and Corralitos Creeks have experienced flooding on numerous occasions during the last 80 years. During the January 4, 1982 storm, continuous overbanking occurred on Corralitos Creek between Maple Avenue and the confluence with East Little Llagas Creek. Overbanking also occurred along Hill Road between Tennant Avenue and Maple Avenue. Figure 3 shows the approximate extent of the flooding.

During the January 1983 storms, flooding occurred along almost the entire study reach of Tennant and Corralitos Creeks. Figure 4 shows the locations and approximate extent of the flooding.

One Percent Flood Problems

The total 1% floodplain area of 194 acres as determined during the PL 566 study is shown in Figure 5. The total estimated damage from a 1% flood on both Tennant and Corralitos Creek is $66,000. Average annual damages are estimated at $15,000 per year. Table 1 lists flood damages by land use type in the 1% floodplain.

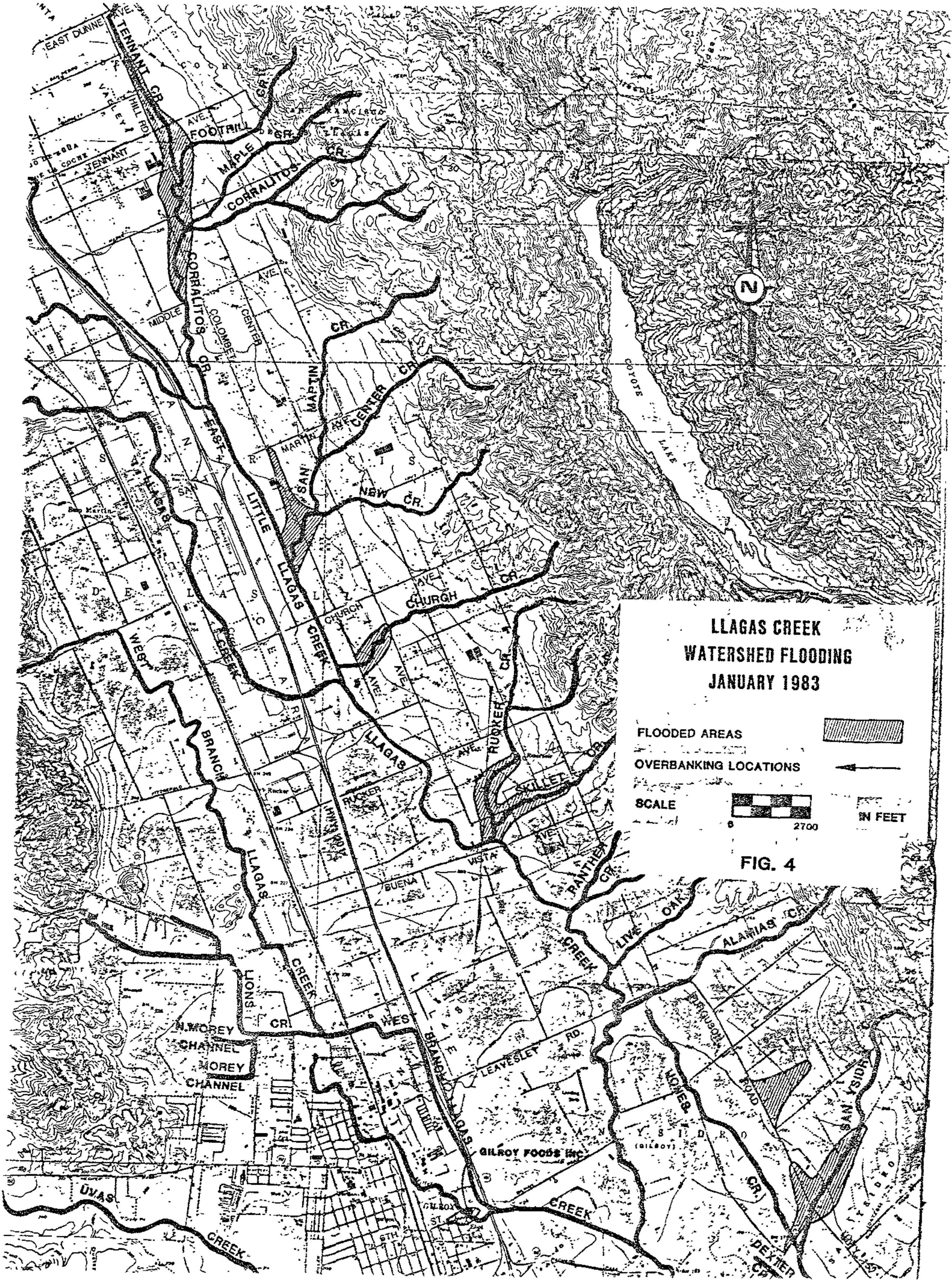
TABLE 1

TENNANT-CORRALITAS FLOOD DAMAGES BY LAND USE

SUMMARY

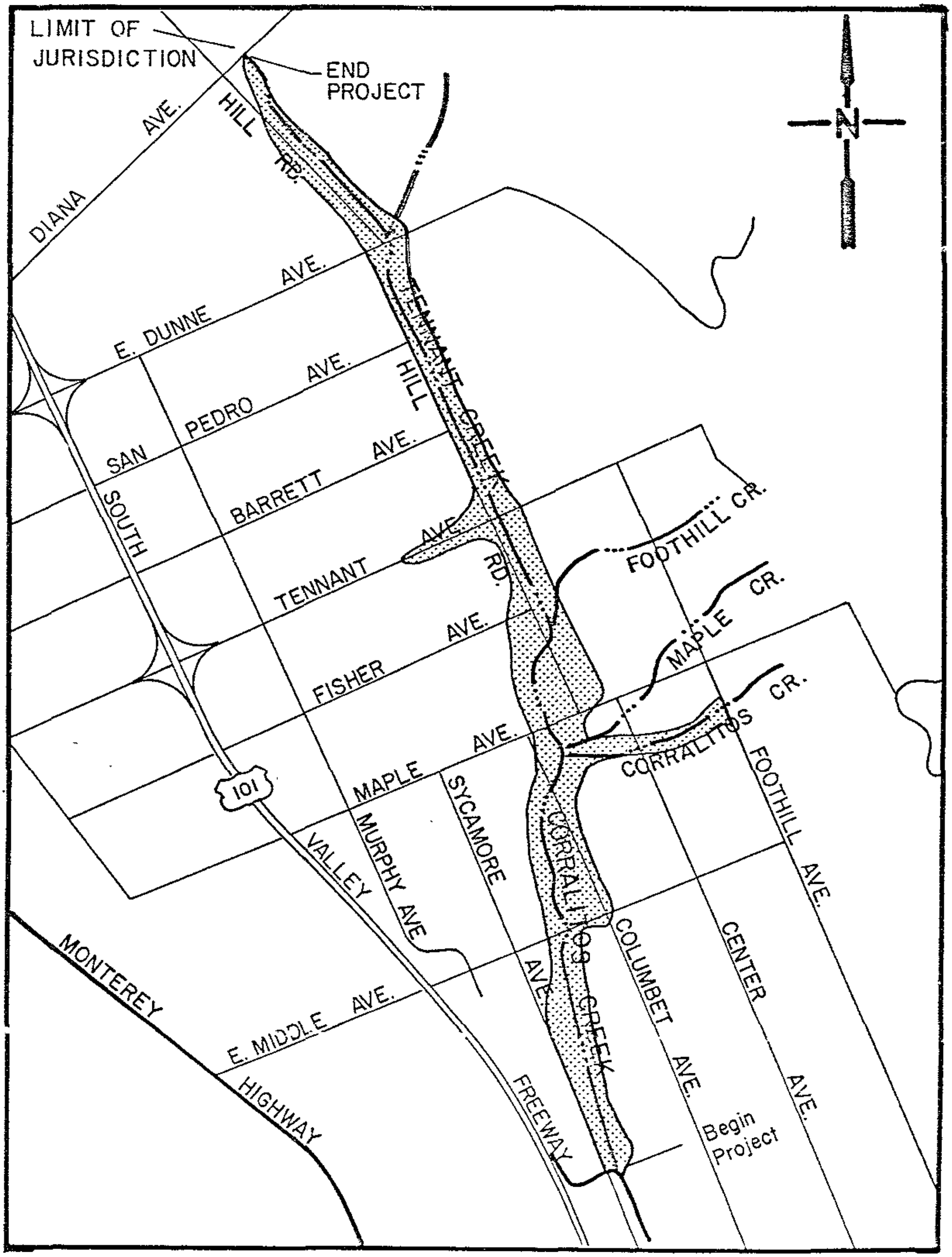
LAND USE	AREA FLOODED ACRES	NUMBER OF BLDGS	DIRECT STRUCT DAMAGE (1000$)	DIRECT CONTENT DAMAGE (1000$)	INDIRECT DAMAGES (1000$)	TOTAL FLOOD DAMAGES (1000$)
SF RESIDENT	64.	38.	40.	12.1	8.	60.
APT RESID	0.	0.	0.	0.0	0.	0.
MOBILE HOME	0.	0.	0.	0.0	0.	0.
COMMERCIAL	0.	0.	0.	0.0	0.	0.
INDUSTRIAL	0.	0.	0.	0.0	0.	0.
SCHLS,PUBLC	0.	0.	0.	0.0	0.	0.
OPEN IMPRVD	0.	0.	0.	0.0	0.	0.
AGRICULTURE	105.	0.	0.	0.0	0.	6.
VACLND/S,PND	25.	0.	0.	0.0	0.	0.
TOTAL	194.	38.	40.	12.1	8.	66.

IF INFORMATION FOR MORE THAN ONE CREEK IS BEING SUMMARIZED HERE, DATA ASSOCIATED WITH AN AREA WHICH FLOODS FROM MORE THAN ONE OF THE CREEKS BEING ANALYZED IS COUNTED ONLY ONCE. FOR EXAMPLE, IF TWO CREEKS ARE BEING ANALYZED, THEN DAMAGES, INSURANCE COSTS, ACQUISITION COSTS, ETC. RESULTING FROM THE COMINGLING FLOODPLAIN WHICH FLOODS TO A COMBINED DEPTH OF 3 FT. IS COUNTED ONLY ONCE IN THIS SUMMARY. HOWEVER, THESE VALUES ARE LISTED IN EACH OF THE CREEK'S OUTPUT ABOVE AS THOUGH THE FLOODPLAIN WAS NOT COMINGLED AND AS THOUGH THE TOTAL DEPTH OF FLOODING WAS FROM EACH CREEK ALONE, I.E., THE INDIVIDUAL LISTINGS FOR BOTH CREEKS WILL EACH INCLUDE THE COMINGLING FLOODPLAIN AREAS AND WILL EACH REFLECT THE, COMBINED FLOOD DEPTH.



LLAGAS CREEK
WATERSHED FLOODING
JANUARY 1983

FIG. 4



TENNANT CREEK AND CORRALITOS CREEK
1% FLOODPLAIN MAP

FIG. 5

Project Alternatives

A number of alternatives were considered for the project. They included excavated earth channel, concrete lined channel, modified floodplain, and in Reach 3, concrete pipe. Table 2 qualitatively compares these alternatives with respect to right of way requirements, construction and maintenance costs and multipurpose benefit potential.

An excavated earth channel with drop structures was selected as the preferred alternative for Tennant and Corralitos Creeks. This alternative will convey the 1% flood flow at a relatively low cost with moderate right of way requirements. The proposed earth channel also satisfies local drainage requirements. The following section describes the preferred alternative in more detail.

Proposed Project

General

The design flows for the proposed project differ from those of the PL566 design. The 1% flowrate has increased substantially because the drainage area was expanded to reflect the County Master Storm Drain Plan and the effects of future changes in land use on runoff were considered (see Table 3). The proposed project has essentially the same alignment as the PL 566 plan and the City of Morgan Hill's General Plan except for the reach between East Little Llagas Creek and Middle Avenue. In this reach, the alignment was shifted approximately 500 feet east at the request of the property owners. North of East Dunne Avenue, the study reach has been extended 1.7 miles beyond the PL566 study reach to Diana Avenue.

The updated design has been prepared so that right of way requirements are minimized. The design uses an excavated earth channel as did the PL566 design. The most significant changes from the PL566 plan are the increases in the culvert sizes and the addition of six drop structures. Table 4 shows existing culvert sizes and proposed drop structure and culvert sizes. Appendix A shows the design parameters used for the proposed project.

TABLE 2

ALTERNATIVE COMPARISON

Alternative	Right of Way	Construction Cost	Maintenance Cost	Social Aspects
Excavated Earth	Moderate	Low	Moderate	Moderate visual impacts
Concrete Lined	Low	Highest	Low	Adverse visual impact
Concrete Pipe (Reach 3)*	Lowest	High	Low	No visual impact
Modified Floodplain	Highest	Lowest	Low	Moderate visual impact, could support natural habitat

*Concrete pipe is only feasible in Reach 3.

TABLE 3

1% DESIGN FLOWS

Reach	1% Design Flows (cfs)		
	Existing*	PL566	1984
1	1980	1440	2400
2			
Downstream of Foothill Cr.	900	640	1200
Upstream of Foothill Cr.	710	640	975
3	200	NI**	400

* Flood Insurance Study.
** Reach 3 not included in PL566 study.

TABLE 4

CULVERTS AND DROP STRUCTURES

Reach	Location	Culverts		Drop Structures 1/
		Existing	Proposed	Proposed
1	E. Middle Ave.	5'x12.5' RCB	Triple 10'x10' RCB	6.0'
1	Columbet Ave.	4'x18.5' RCB	Triple 10'x10' RCB	5.8'
2	Maple Ave.	3'x6' RCB	Double 8'x10' RCB	
2	Hill Rd.	3'x6' RCB	Double 8'x10' RCB	5.0'
2	Sta. 41+50 (Santa Clara Conduit Crossing)	-	-	2.8'
2	Tennant Ave.	3.8'x12' RCB	Double 8'x8' RCB	
2	Sta. 67+50	-	-	6.4'
2	Fountain Oaks Dr.	Double 3' Pipe	Double 7'x10' RCB	4.4'
2	E. Dunne Ave.	3' Pipe	Double 8'x8' RCB	
3	Rosetta Dr.	-	8'x8' RCB	
3	Shafer Ave.	-	8'x8' RCB	
3	Hendry Dr.	-	8'x8' RCB	
3	Diana Dr.	-	6' Pipe	

1/ All drop structures are SCS Type "C".

The cost of the proposed project is 5.5 million dollars. Appendices B, C, and D show item-by-item and reach-by-reach breakdowns of cost. The following sections describe each reach of the proposed project in detail.

Reach 1 - Corralitos Creek from East Little Llagas Creek to Tennant Creek

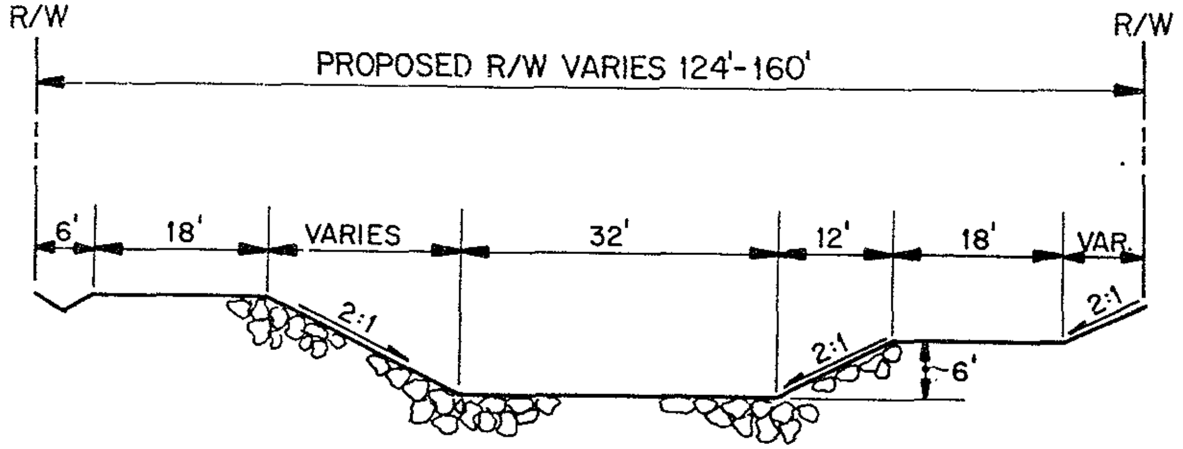
The proposed channel for this reach is an excavated earth channel with one depressed maintenance road and one maintenance road on the top of bank (Figure 6). The design flow rate for this reach is 2400 c.f.s. This section will have a bottom width of 32 feet and side slopes of 2 to 1. The proposed section will necessitate a right of way that varies from approximately 124 to 144 feet. The estimated cost for the proposed improvements on Reach 1 is $2,292,000 in 1984 dollars.

Reach 2 - Tennant Creek from Corralitos Creek to East Dunne Avenue

The proposed channel section for Reach 2 is similar to that described in Reach 1 but smaller reflecting the lower design flowrates of 1,200 c.f.s. downstream of Foothill Creek and 975 c.f.s. upstream of Foothill Creek. This section will have a bottom width of nine feet and side slopes of 2 to 1. The right of way width required varies from approximately 120 to 140 feet. The estimated cost of the proposed improvements along this reach is $2,423,000 in 1984 dollars.

Reach 3 - Tennant Creek from East Dunne Avenue to Diana Avenue

The proposed section for this reach is an excavated earth channel with a depressed maintenance road. The design flow rate for this reach is 400 c.f.s. The proposed channel would have a bottom width of five feet and side slopes of 2 to 1. The alignment for this reach is constrained by the alignment of the Santa Clara Conduit and existing development along this reach. The proposed alignment is approximately that which is indicated on the Morgan Hill Master Storm Drain Plan. The right of way required by the proposed section is approximately 75 feet. The estimated cost of the proposed improvements along this reach is $793,000 in 1984 dollars.



TYPICAL SECTION
PROPOSED PROJECT REACH 1
N.T.S.

NOTE: SECTION VIEWED LOOKING UPSTREAM

FIG. 6

The General Plan does not indicate any public facilities along the existing creek or the proposed alignment. Vegetation along the creek is primarily limited to grasses, small shrubs, and occasional trees. Because of the ephemeral nature of the stream and cultural practices, the stream does not support a lush vegetative habitat. The only substantial loss of habitat would occur in realigning Corralitos Creek between East Little Llagas Creek and E. Middle Avenue.

Funding and Implementation

Currently, there are no District funds available to acquire land for or construct the proposed project. For approximately the next fifteen years, the majority of the District's funds for the South Flood Control Zone are committed to the Uvas and Llagas Creek projects. Should any additional funds become available, allocation of those funds would be subject to a zone wide priority study. Funding for Tennant and Corralitos Creeks would be subject to the results of that study.

Although the District cannot currently fund the proposed project, a number of strategies exist for funding its construction and annual maintenance. The majority of these strategies would rely on the City of Morgan Hill or Santa Clara County for implementation. Table 5 lists these strategies, their sponsors and their probable application to the proposed project.

Interim Measures

Due to the difficulty of funding the entire proposed project, it is unlikely that the proposed project can be constructed in the near future. Measures that are consistent with the proposed 1% design could be constructed in stages to provide interim relief as funding becomes available.

TABLE 5

FUNDING STRATEGIES/SOURCES

Program	Sponsor/Administrator	Application to Project
Capital Improvement Plan	City/County	Culvert replacement.
Federal Aid Highway Program	Caltrans	Culvert replacement.
Developer Constructed Facilities	City/County On-site detention facilities.	Channel construction.
Drainage Fees	City/County On-site detention facilities.	Channel construction.
Special Benefit Zones Property Owners	District/City/[1] On-site detention facilities.	Channel construction.

[1] Requires an agreement between the District, the City and a joint venture of sponsoring property owners.

Appendix E lists proposed interim measures and their associated costs. The total cost for these proposed interim measures is approximately $705,000. Interim measures for each reach are described below.

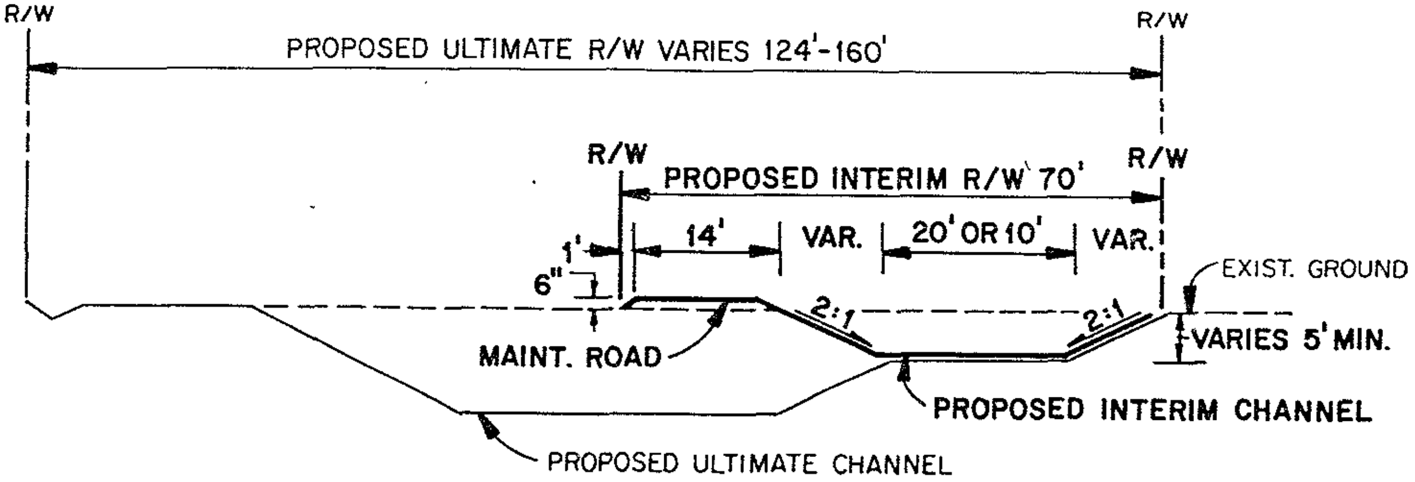
Reach 1

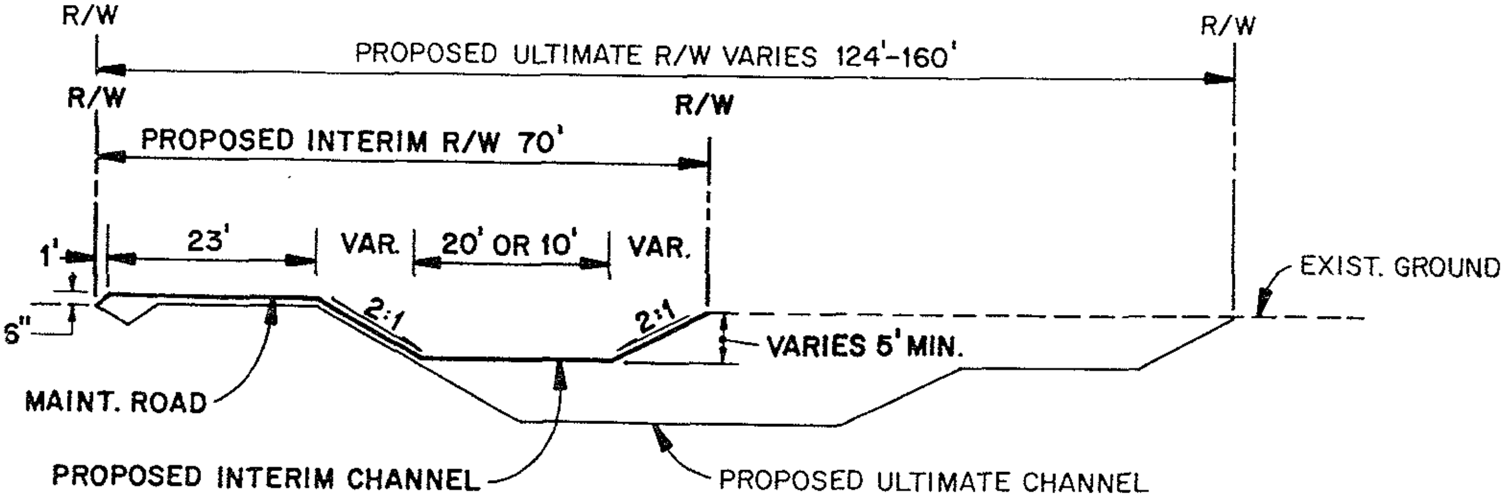
Currently, the portion of the study reach downstream of East Middle Avenue is subject to frequent flooding. In this reach it is proposed that a trapezoidal channel, with a 20-foot bottom width and 2 to 1 side slopes, be excavated along the alignment shown on Sheet 1 of the interim project plans. Figure 7 shows typical cross sections of the proposed channel. The proposed channel would have sufficient capacity to convey the existing 10-year flood flow. The alignment corresponds to the proposed 1% design alignment. As was mentioned above, this alignment was shifted from that shown on Soil Conservation Service PL566 plans at the request of the property owners. Because work must proceed upstream, the first step would be to excavate approximately 700 feet of the proposed interim channel through the District property at the confluence of Corralitos and East Little Llagas Creeks.

Upstream of East Middle Avenue the interim channel is sized to equal the existing culvert capacity at East Middle Avenue. It is proposed that a trapezoidal channel, with a five-foot bottom width and 2 to 1 side slopes be excavated along the alignment shown on Sheets 1 and 2 of the interim project plans.

Reach 2

Interim channel capacity in Reach 2 is constrained by the culvert capacity at Maple Avenue. It is proposed that a trapezoidal channel with a five-foot bottom width and 2 to 1 side slopes, be excavated along the alignment shown on Sheets 2 and 3 of the interim project plans. Work on Reach 1 must be completed prior to work on Reach 2.





TYPICAL SECTIONS

PROPOSED INTERIM PROJECT REACH 1

N.T.S.

NOTE: SECTIONS VIEWED LOOKING UPSTREAM

FIG. 7

Reach 3

The interim measures proposed for Reach 3 consist of construction of the new culvert underneath E. Dunne Avenue. Work on Reaches 1 and 2 must be completed prior to work on Reach 3.

Table 6 shows the construction staging and costs of the proposed ultimate and interim projects.

TABLE 6

PROPOSED INTERIM AND ULTIMATE FACILITY CONSTRUCTION STAGING

Reach		Proposed Measure	Estimated 1984 Cost
1	Corralitos Creek to Tennant Creek	Excavate interim channel, backfill existing channel.	$328,000
2	Tennant Creek to East Dunne Avenue	Excavate interim channel, backfill existing channel.	$292,000
3	East Dunne Avenue	Construct culvert.	$85,000
1	Corralitos Creek to Tennant Creek	Excavate proposed channel, construct drop structures and culverts.	$2,292,000 *
2	Tennant Creek to East Dunne Avenue	Excavate proposed channel, construct drop structures and culverts.	$2,423,000 *
3	E. Dunne Avenue	Excavate proposed channel, construct culverts.	$793,000 *

*Proposed project costs assume no expenditures for the interim project.

CONCLUSIONS

The excavated earth channel proposed in this study for Tennant and Corralitos Creeks will safely convey the 1% flood, and provide for local drainage. Because of limited funding and existing priorities in the south zone the District can not actively participate in channel improvements on these creeks for several years.

Measures have been identified which would be consistent with the ultimate project and provide moderate interim flood protection. Possible funding strategies and a construction staging are also identified. Implementation of these measures will require cooperation of the City of Morgan Hill, Santa Clara County, this District, adjacent property owners, and future land developers.

APPENDIX A

DESIGN PARAMETERS

Parameter	Design Value
Manning's , 1% flow	.035
Manning's , 10% flow	.025
Freeboard (excavated channel)	1' or .2 x Total Energy, whichever is greater
Maximum allowable velocity	7 ft/sec.
Minimum $\frac{\text{curve radius}}{\text{channel width}}$	3
Minimum maintenance road width	15'
Maximum earth maintenance road grade	15%

APPENDIX B

TENNANT-CORRALITOS CREEK

-COST ESTIMATES SUMMARY-

ITEM	UNIT COST	UNIT	QUANTITY	AMOUNT
CLEARING & GRUBBING	$2000	ACRE	58	$116000
EARTHWORK				
-EXCAVATE	$2	C.Y.	503407	$1006814
CHANNEL LINING				
-ROCK	$45	C.Y.	15870	$714150
STRUCTURAL				
-CONCRETE CULVERTS	$400	C.Y.	1140	$456000
-DROP STRUCTURES	$400	C.Y.	1200	$480000
-CONCRETE VAULT	$400	C.Y.	10	$4000
MISCELLANEOUS				
-ARMORING AGG. (MAINT RD)	$20	C.Y.	12400	$248000
-SUBTOTAL-				$3024964
MOBILIZATION (5%)				$151248
CONSTR. CONTINGENCIES (10%)				$317621
- TOTAL CONSTRUCTION COSTS-				$3493833
ENGINEER, ADMIN. & INSPECTION (18%)				$628890
RIGHT OF WAY		L.S.		$1385000
-TOTAL COSTS-				$5507723

APPENDIX C

REAL ESTATE VALUES

Location	Cost ($/Ac)
E. Little Llagas Creek to Maple Avenue	20,000
Maple Avenue to Barrett Avenue	22,500
Barrett Avenue to Diana Avenue	32,250

APPENDIX D

TENNANT CORRALITOS CREEK

REACH ONE
-COST ESTIMATES SUMMARY-

ITEM	UNIT COST	UNIT	QUANTITY	AMOUNT
CLEARING & GRUBBING	$2000	A.C.	20	$40000
EARTHWORK				
-EXCAVATE	$2	C.Y.	313250	$626500
CHANNEL LINING				
-ROCK	$45	C.Y.	8030	$361350
STRUCTURAL				
-CONCRETE CULVERTS	$400	C.Y.	418	$167200
-DROP STRUCTURES	$400	C.Y.	215	$86000
MISCELLANEOUS				
-ARMORING AGG. (MAINT RD)	$20	C.Y.	5500	$110000
-SUBTOTAL-				$1391050
MOBILIZATION (5%)				$69553
CONSTR. CONTINGENCIES (10%)				$146060
- TOTAL CONSTRUCTION COSTS-				$1606663
ENGINEER, ADMIN. & OVERHEAD (18%)				$289199
RIGHT OF WAY		L.S.		$396000
-TOTAL COSTS-				$2291862

TENNANT CORRALITOC CREEK
REACH TWO

-COST ESTIMATES SUMMARY-

ITEM	UNIT COST	UNIT	QUANTITY	AMOUNT
CLEARING & GRUBBING	$2000	A.C.	24	$48000
EARTHWORK				
-EXCAVATE	$2	C.Y.	133982	$267964
CHANNEL LINING				
-ROCK	$45	C.Y.	7115	$320175
STRUCTURAL				
-CONCRETE CULVERTS	$400	C.Y.	594	$237600
-CONCRETE DROP	$400	C.Y.	985	$394000
MISCELLANEOUS				
-ARMORING AGG. (MAINT RD)	$20	C.Y.	5700	$114000
-SUBTOTAL-				$1381739
MOBILIZATION (5%)				$69087
CONSTR. CONTINGENCIES (10%)				$145083
- TOTAL CONSTRUCTION COSTS-				$1595909
ENGINEER, ADMIN. & OVERHEAD (18%)				$287264
RIGHT OF WAY		L.S.		$540000
-TOTAL COSTS-				$2423172

TENNANT CORRALITOS CREEK
REACH THREE

-COST ESTIMATES SUMMARY-

ITEM	UNIT COST	UNIT	QUANTITY	AMOUNT
CLEARING & GRUBBING	$2000	A.C.	14	$28000
EARTHWORK				
-EXCAVATE	$2	C.Y.	56175	$112350
CHANNEL LINING				
-ROCK	$45	C.Y.	725	$32625
STRUCTURAL				
-CONCRETE CULVERTS	$400	C.Y.	128	$51200
-CONCRETE VAULT	$400	C.Y.	10	$4000
MISCELLANEOUS				
-ARMORING AGG. (MAINT RD)	$20	C.Y.	1200	$24000
-SUBTOTAL-				$252175
MOBILIZATION (5%)				$12609
CONSTR. CONTINGENCIES (10%)				$26478
- TOTAL CONSTRUCTION COSTS-				$291262
ENGINEER, ADMIN. & OVERHEAD (18%)				$52427
RIGHT OF WAY		L.S.		$449000
-TOTAL COSTS-				$792689

APPENDIX E

TENNANT CORRALITOS CREEK
INTERIM PROJECT

-COST ESTIMATE SUMMARY-

ITEM	UNIT COST	UNIT	QUANTITY	AMOUNT
EXCAVATION	$2	C.Y.	72138	$144276
MOBILIZATION (5%)				$7214
CONSTR. CONTINGENCIES (10%)				$15149
- TOTAL CONSTRUCTION COSTS-				$166639
ENGINEER, ADMIN. & INSPECTION (18%)				$29995
CULVERT @ E. DUNNE AVE		L.S.		85000
RIGHT OF WAY		L.S.		$423700
-TOTAL COSTS-				$705334

CORRALITOS CREEK
INTERIM PROJECT REACH 1
STA 0+00 TO STA 44+20

-COST ESTIMATE SUMMARY--

ITEM	UNIT COST	UNIT	QUANTITY	AMOUNT
EXCAVATION (20' WIDE CHANNEL)	$2	C.Y.	33300	$66600
MOBILIZATION (5%)				$3330
CONSTR. CONTINGENCIES (10%)				$6993
- TOTAL CONSTRUCTION COSTS-				$76923
ENGINEER, ADMIN. & INSPECTION (18%)				$13846
RIGHT OF WAY		L.S.		$129000
-TOTAL COSTS-				$219769

CORRALITOS CREEK
INTERIM PROJECT REACH 1
STA 44+20 TO STA 0+00 TENNANT CR.

-COST ESTIMATE SUMMARY-

ITEM	UNIT COST	UNIT	QUANTITY	AMOUNT
EXCAVATION (10' WIDE CHANNEL)	$2	C.Y.	15980	$31960
MOBILIZATION (5%)				$1598
CONSTR. CONTINGENCIES (10%)				$3356
- TOTAL CONSTRUCTION COSTS-				$36914
ENGINEER, ADMIN. & INSPECTION (18%)				$6644
RIGHT OF WAY		L.S.		$65000
-TOTAL COSTS-				$108558

TENNANT CREEK
INTERIM PROJECT REACH 2
STA 0+00 TO STA 20+50

-COST ESTIMATE SUMMARY-

ITEM	UNIT COST	UNIT	QUANTITY	AMOUNT
EXCAVATION (5' WIDE CHANNEL)	$2	C.Y.	1600	$3200
MOBILIZATION (5%)				$160
CONSTR. CONTINGENCIES (10%)				$336
- TOTAL CONSTRUCTION COSTS-				$3696
ENGINEER, ADMIN. & INSPECTION (18%)				$665
RIGHT OF WAY		L.S.		$61300
-TOTAL COSTS-				$65661

TENNANT CREEK
INTERIM PROJECT REACH 2
STA 20+50 TO STA 47+60

-COST ESTIMATE SUMMARY-

ITEM	UNIT COST	UNIT	QUANTITY	AMOUNT
EXCAVATION (5' WIDE CHANNEL)	$2	C.Y.	11617	$23234
MOBILIZATION (5%)				$1162
CONSTR. CONTINGENCIES (10%)				$2440
- TOTAL CONSTRUCTION COSTS-				$26835
ENGINEER, ADMIN. & INSPECTION (18%)				$4830
RIGHT OF WAY		L.S.		$84000
-TOTAL COSTS-				$115666

TENNANT CREEK
INTERIM PROJECT REACH 2
STA 47+60 TO STA 38+00

-COST ESTIMATE SUMMARY-

ITEM	UNIT COST	UNIT	QUANTITY	AMOUNT
EXCAVATION (5' WIDE CHANNEL)	$2	C.Y.	9641	$19282
MOBILIZATION (5%)				$964
CONSTR. CONTINGENCIES (10%)				$2025
- TOTAL CONSTRUCTION COSTS-				$22271
ENGINEER, ADMIN. & INSPECTION (18%)				$4009
RIGHT OF WAY		L.S.		$84400
-TOTAL COSTS-				$110679

TENNANT CREEK
INTERIM PROJECT REACH 3
EAST DUNNE AVENUE

-COST ESTIMATE SUMMARY-

ITEM	UNIT COST	UNIT	QUANTITY	AMOUNT
DOUBLE 8'x8' RCB CULVERT UNDER E. DUNNE AVENUE			L.S.	$85000